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DLXXXVI.—A BUDGET FROM YUNNAN.

The following extracts from a series of letters addressed to Kew by Dr. Henry during last year give an interesting picture of the fascinating flora of Yunnan. Till within the last few years its botanical wealth had not been suspected. Dr. Henry's scientific work has only been accomplished in the intervals of engrossing official duties. It is difficult to conceive what results might not be obtained by a systematic scientific exploration of the country.

From the point of view of geographical distribution, the most interesting fact is the southern extension of vegetation of the Himalayan type. This is fused with a Chinese element purely endemic.

A former letter was printed in the *Kew Bulletin* for 1897 (pp. 99-101).

“Dr. A. HENRY to ROYAL GARDENS, KEW.

“Customs, Mengtse, par Laokai, Tongking,  
“February 23, 1897.

“DEAR Mr. THISELTON DYER,

“I have just returned from an exceedingly interesting trip to the country south of the Red River, in a district ruled over by an hereditary chief, who treated me with great kindness.

“I reached the great range separating the Red River and Black River basins, densely wooded with large trees (20 feet in circumference) to near the summit, where they are replaced by thick bamboo jungle, so that the range, which is very long, is only crossable by passes at different points. The altitude is 8,000 to 10,000 feet. At this, the dead point of the year as regards vegetable life, there was not much out in flower, but I secured a magnificent *Rhododendron*, a *Magnolia* (both great trees), three *Camellias*, *Stuartia*, &c. There was a *Daphne* (*indica*?), a shrub with deliciously scented white flowers, a *Primula* at the summit, *Ainsliea*, two or three species of *Clematis*, &c. Two or three *Araliaceæ*, shrubs and trees, occur also up to the summit.

“A very common tree was Oliver's *Tetracentron sinense*, an enormous tree, but with the wood little esteemed. Its fruit spikes were scattered everywhere, and its minute seeds had flown away.

"I spent two days on the Red River, where the vegetation is tropical; the banana, tomato, *Carica* and Tamarind occurring everywhere in the wild state. The bizarreness of some of the fruits here was very striking. One tree (*Dolichandrone Caudafelina*) has long pods (2 to 3 feet) with a dense covering of thick brown hair, exactly like the tail of an animal.

"On the plateau (7,000 — 6,000 feet) between here and the Red River I found a curious *Primula*, with radical leaves besetting its base like an onion; it successfully resists the grass fires which here are universal, and flowers indifferently level with the ground or on a peduncle 6 to 8 inches high.

"Immense evergreen oaks occurred in the mountain forest.

"The most interesting part of the trip was the aborigines. In the State, 20 miles by 20 miles, ruled over by the chief, not including Chinese settlers, I met with seven distinct races, *i.e.*, distinct physiognomy, speaking mutually unintelligible languages, living apart, never intermarrying, and with different customs and dress.

"Their languages, of which I collected short vocabularies, fall into three divisions, Shan, Miao-tze and Lolo, all of the Chinese type, monosyllabic, non-inflectional. I found the Lolo writing to be in daily use. It is apparently derived from ancient Chinese, say 2,000 years ago, and I have little doubt is the remnant of a highly civilised State. If my information is to be trusted, books of great interest will be found still existing in MS. in this language.

"Great red deer, bears large and small, occur in the mountain forests, the smaller bears leaving scratch marks on the trees, in which they build nests to sleep in.

"I have laid, I hope, the seeds of a friendship with the chief, and hope to gain much thereby, *i.e.*, an intimacy with the aborigines, which is a difficult matter indeed.

"April 30, 1897.—My own collection has already attained gigantic proportions. I have numbered and labelled 660 distinct species, without making a perceptible gap in the immense pile of bundles of dried plants. I almost anticipate 3,000 species in this year's collection, *i.e.*, the year finishing on 1st July. My muleteer is doing good work, being constantly on the road; and I myself am doing everything within a radius of 15 miles round Mengtse, which includes mountains to 7,000 feet altitude.

"Franchet, I believe, estimates Delavay's species from Western Yunnan to be 3,000 in number. Both our collections will have at least 5,000 species, and I venture to predict that Yunnan, when thoroughly explored (say in the 20th century) will be found to have 10,000 species of plants (phanerogams and ferns with their allies).

"The Rhododendrons have been very captivating. They vary in size from gigantic trees to the tiniest shrubs. The most striking one is apparently confined to a mountain peak north of here, some 20 miles. It has broadly oval leaves, about 12 inches long by eight inches broad, brown on the under surface, and the flowers are a delicate primrose yellow, quite large and very numerous.



"The spp. of *Clematis* are about 20 to 25 species; Oaks 15; *Rubus* 15; Primulas 10 (these have been very disappointing in number, and none is conspicuous in any way). The Conifers include *Cunninghamia*, *Cryptomeria*, *Keteleeria*, and three species of *Pinus*; one of these is *P. massoniana*; another is very remarkable for its perfectly white bark and large cones, with big edible seeds, perhaps allied to *P. koraiensis* and *P. Armandi*; the third I have just discovered. It is one solitary big tree planted on the top of a mountain, over four graves. I haven't yet secured cones. It is beautifully pyramidal in shape and with delicate, very green foliage, and a port different from any pine I have seen in China.

"Talking of soap-trees, there are two here, *Gleditschia Delavayi*, with its enormous pods, some 20 inches long, and *Pancoria Delavayi*. The latter is an exact imitation of *Sapindus Mukorossi*. Of course it differs technically in flowers and indumentum of the leaves, but no mere non-botanist would dream of putting them in different genera. I will send plenty of fruit of both (and seeds).

The *Leguminosæ* are very numerous; *Desmodium*, *Lespedeza* and *Pueraria* running riot in number of species. I have secured some very northern forms, as a *Fagus*, a *Betula*, &c.

"I am inclined to think that isolation, as in Yunnan by its multitudinous ranges and valleys, must play a great part in the invention of new species, and the study of the flora of this province will, I think, enable some one hereafter to get at important factors in this evolution. One of the most curious so-called species here is *Ehretia corylifolia*; it is a distinct species, but how near it is to the common *Ehretia macrophylla*! if I don't mistake, I think I shall get connecting links. *Pari passu* with the richness of types in the vegetable kingdom is the extraordinary diversity of the genus *Homo*. One is inclined at first to think that all the tribes one hears of must be the same people often under a new name. That is not so; the languages are distinct, and the physical characteristics are often very well marked, too.

"I have two Lolo MSS. and as yet can't get a Lolo to come and explain them. The investigation of this writing will throw, I believe, a new light on Chinese. Of the native languages, three great stocks (Miao-tze, Lolo, Shan) are of the Chinese type, *i.e.*, monosyllabic, tonal, non-inflecting, non-agglutinative. The question of tones is a difficult one. One can scarcely understand any people beginning a language with such an absurdity, say, as the Shan words:—

má to come,  
mā a dog,  
mâ a horse,

and so on in five or six ways altogether. I have an idea of the origin, which I won't give away just yet. What do you think? Give a guess. Do you suppose such things as tones are original and fundamental, or derived and secondary?

"Malay, which is polysyllabic and non-tonal connects on to the Chinese group by certain peculiarities which don't occur in other groups of languages. The Chinese group (*i.e.*, Chinese, Miao-tze, Lolo, Shan, Annamese, Siamese) display one curious sub-division, in some the adjective follows the noun always, in others (as Chinese) it precedes the noun.



"In addition to my own collection, I have received from Morse, at Lungchow in Kwangsi province, some 400 species. Some are quite interesting. He sends me *Tournefortia sarmentosa*, which is hitherto known only as an Oceanic plant (Formosa, Mauritius, Philippines, Australia), and it is like the very pretty *Osteomeles anthyllidifolia* in this respect. By the way, have you the latter in cultivation? He also sends me *Dolichandrone Cauda-felina*, which I found on the Red River. Its pods are the most comic of fruits; a long tail of some prehistoric animal would be near it. What is the meaning of the projecting hook on fruit of trees, such as *Cesalpinia Sappan*? Is it because other climbing *Cesalpinias* have such a point? It doesn't mean a time when tall beasts like giraffes and so on rambled about and got fruits from big trees stuck in their wool. Of course, there are monkeys running about in the trees. I can't see any possible use, *e.g.*, in hairs of fruit of *Pueraria thunbergiana*, at least any at present. The fruits stick on the climbing shrub till they dehisce, and out drops the seed.

"I forgot to say that I have secured a magnificent *Paulownia* (the flowers are not precocious). Unfortunately I haven't flowers of either of the two described *Paulownias* (*P. Fortunei* and *P. imperialis*) to compare with it, but it seems to differ from both; it has much smaller capsules than *P. Fortunei*, according to description. It is the most magnificent tree, in some ways, that I have ever seen. Seeds of it will have to be collected later on. It would really take a dozen enthusiastic botanists to cope with the work here.

"The Lilies are only four for so far: *Lilium Brownii* (?), a lily with yellow flowers, numerous; and a small lily with a solitary pink flower, and *L. giganteum*. The Orchids are very numerous. But I could go on indefinitely.

"My photographic camera, which has been four months on the way from Haifong to here, is just about to arrive. Can you give any suggestions concerning the uses of photography in botany? Of course, I suppose pictures of trees like the *Paulownia*, just spoken of, pictures of curious fruits, &c., will be useful. I mean some good scientific line. If you can, please answer the question, and refer me to books or journals, if necessary, for illumination.

"Szemao (the newly opened port west from here) is doing pretty well. I notice in the estimates that £800 is provided as salary for Consul at Momein (Têng Yueh), and I suppose that place will have a Customs also. Then the railway is being pushed on from Mandalay to Kun-lon on the River Salwen, and that will mean another station. Already Wuchow is open on the West river to Canton, or, to put it pictorially, five new places on the five great rivers, five points of entry into Southern China. Lungchow, which is in Kwangsi, and is being connected by rail with Haifong or Hanoi, does no trade practically."

"June 3, 1897.—I find, when I go with my pony into the woods, that the wild animals seem less frightened, so I get good glimpses occasionally of deer, weasels, small black ones and large flying ones, of partridges, pheasants, snakes, etc. But the other day I saw bigger game; I was in a deep ravine, with the pony and dog left behind on the side of the hill above. I heard loud



and angry barking. I clambered up, and through the trees soon discerned a great spot of orange ; it loomed so large I thought it must be a tiger. Further up I saw a beautiful leopard taking a quiet look at the pony. Loud I halloed—no sign of the dog; the leopard skulked off over the hill. Sorrowfully I rode off, making much melancholy reflection over poor “Jack,” the dog. To my astonishment I found him lying waiting for me near the foot of the hill, in an open space where he could look all around. He had been mauled, but not severely, by claws and teeth, but in some mysterious way had escaped out of the leopard’s clutch.

“They talk about the spots of the leopard being protective, but there is no such brilliant object in nature as a leopard on the sunny side of a rocky hill. These beasts are nocturnal in habit, and perhaps his courage was less on that account, and he let the dog go when the latter showed fight. How he did bark, so angrily! Wallace is right about the happiness of animals. After such a terrible encounter, the dog immediately was in excellent spirits, and had quite forgotten his danger. Curiously enough, the pony wasn’t a bit frightened either.

“With regard to seeds, I will do what I can, especially later on, when I shall have less plant collecting to do in our immediate neighbourhood. But it is really a difficult matter collecting seeds ; one arrives on the ground too late or too early. I tried, *e.g.*, to collect seeds of *Gentiana Serra* and *rhodantha*, common plants, and failed to get a single seed. You may say, why not employ a native. Ah! you don’t know the Yunnanese. My muleteer, who collects plants, is the only man I know who could or would do the work, and even he only does about one-tenth of what I could do if I had his time. The others, Chinese and aborigines, are too lazy for seed-collecting. I have secured the first aborigine who would venture into foreign employment ; no one had any but Chinese before. He is my groom, and is an experiment.

“The fact is that if one had nothing else to do, one might organize plans and people for carrying on such work ; but it is difficult for me, as I have a good deal to do. And yet I doubt if many of my specimens will be collected again for 50 years, as I have put no small amount of energy into parts of the botanizing. The flowers of a certain *Zanthoxylum* have cost me three visits to one spot and an expenditure of six hours time.

“Money is not what is wanted, but time, oceans of time. Nothing astonishes people at home so much as the fact, a real fact, that in countries like China you cannot do everything with money. Patience is more valuable. I can get a good deal of work out of Chinese on a trip, when I am with them, but not otherwise. Chinese are very susceptible to weather, a shower breaks their hearts ; they don’t like going into jungle, as thorns annoy them and tear their clothes. Now, I don’t mind 100 thorns ; I wait till I have a lot in, then sit down and pick them out.

“For the Chinese, the root of the matter is an absence of nervous energy. Their industry, so much talked of, is unreal in most parts of the Empire. They are not exactly lazy, but they



don't know how to begin to work, as compared with a European. And as to their ever seriously fighting or competing in the arts of peace or war with the Anglo-Celtic race, it is an idle dream."

"July 19, 1897.—I would suggest, so great is the variety and beauty of the Chinese flora, and so fit are the plants for the European climate, that an effort ought to be made to send out a small expedition, the funds, *e.g.*, being provided by a syndicate of, say, a horticulturist, a private gentleman or two, &c. I estimate £1,000 would cover the expenses for two years; and what I would recommend is that a man be selected who has just finished his botanical studies at Cambridge. I mean, don't send a collector, but a gentleman, a student and an enthusiast. The locality I would suggest is the mountain range separating Szechwan from Shensi, or thereabouts, the expedition starting from Ichang in April and covering two seasons.

"A person like me, with daily official work, can do little or nothing. We live in towns, in the midst of cultivation, and the distances to get to the hunting grounds are enormous, and when we do get there we are half worn out. There is also something uncanny in the way in which herbaceous plants disappear out of view after they have had their gaudy season of flowering, and when the plant is found the seeds are green, or the capsules are empty. Such are some of the difficulties.

"My own plant collecting, since I have been here, is enormous, but at such an expenditure of muscular force! It would be strictly paralleled by that of a bank-clerk in London who made excursions on Sundays all over England, and two or three times a year made hurried trips to the Carpathians and the Pyrenees. The bank-clerk would really in such a way expend less energy.

"I have been reading your account of the *Cyclamen*, which I find very interesting. In a place like this, where one is overwhelmed with the multitudes of species of plants, one is interested in any speculation concerning the reason why. In a previous letter I spoke of the red clay deposit so common in this province, and hinted at its possible glacial origin, but I don't think now there has been the slightest glaciation here, the clay is simply a wash-out of the universal limestone, and what one finds here is a country which has not been disturbed geologically for an immense period. The country is cut up into innumerable valleys and petty plains and isolated peaks; and isolation seems to be the factor which has kept up so many different forms of life, once they were started.

"Another interesting series of questions is to find out what are the uses of the supposed adaptations one sees, *e.g.*, what is the use of the fur like the tail of a cat on the fruit (an enormous fruit) of *Dolichandrone Cauda-felina*, a small tree which occurs in the Red River valley. In this hot steaming valley there are many extraordinary fruits; now-a-days there are scarcely any large animals, except tigers and leopards. But there are multitudes of large and ferocious ants which destroy the foliage of many trees for nest-building purposes.

"I assume that everything of this kind has a meaning, a use, if one could find it out, and people forget the part which enormous



and curious animals in former geological times have played. Take the question of thorns. I think they do serve as protection against animals, and are not, as regards their preservation, when once developed, mere expressions of climate and soil changes.

"I was quite disappointed in the spring flora here. The first half of the year is rainless, and, except in woods with perennial springs and streamlets, the whole country remains almost barren. There is consequently a great variety of plants which can bear long and sustained drought, and the dodges are innumerable. The bulbous covering of scaly leaves in the primrose I mentioned as coming up in the burnt grass hills is, of course, not a dodge against grass-fires, but a dodge against the drought it sustains.

"There is one point in connection with the change in the cultivated *Primula sinensis* which is not, I think, generally known. The wild form occurs in such a different condition of soil from what is adopted in cultivation. In the Yangtze gorges the wild form grows on cliffs in practically earthless ledges, and merely midst the piled-up remains of previous years' leaves, &c. In a word, it occurs in the driest possible situation, and I don't think even in wet weather, in summer, these ledges, when it occurs, really get wet. I am now speaking from memory, but I think I am quite correct as to the habit of the wild plant. The ledges, often hundreds of feet in length, present a beautiful appearance at flowering time in the dry winter season. In connection with this, there is no history to be got of when or how the Chinese began the cultivation of such plants, and it is quite remarkable how few specimens of really wild forms of many cultivated Chinese decorative plants there are, and also curious how many plants called *japonica* are only Japanese in cultivation, and are originally Chinese in origin.

"It is also remarkable that the Chinese shrubs in cultivation are scarcely the ones which make the best show in the wild state. At least, that is my opinion.

"In conclusion, I can see now that there were hundreds of interesting points which I might have noticed earlier in my plant collecting if I had had the experience or the genius or the teaching.

"If you ever again come across a budding collector like what I was when we began correspondence some years ago, please insist on him being more than a mere collector, and perhaps you will help to develop a naturalist.

"August 2, 1897.—I enclose a photograph taken by Mr. Bons d'Anty in the Upper Shan States south of Szemao. He is the French Consul at Szemao, and is collecting some plants for me, the interesting ones of which you will receive later.

"He says: 'The palm is very common; it is seen around every temple, and the leaves are used to make paper with, or rather are used as paper, being cut into long strips. In the photograph one can see the way the leaves are cut off for this purpose.'

"I am in doubt as to what the palm is, but doubtless you will be able to identify it at Kew [probably *Trachycarpus* sp.].



"The palms used as paper are *Borassus* and the Talipot palm, according to Treasury of Botany, but it doesn't seem to me to fit in with descriptions of these.

"I also enclose for the Museum, if you think it is of sufficient interest, a sample of the palm-strips with writing on it, sent me by Mr. Bons d'Anty. The writing is probably Shan, but Mr. Bons doesn't say.

"From a packet of plants sent me by Mr. Bons, collected on a trip south of the Chinese frontier, into the British Shan States, it would seem that the flora changes at once into the Indian type the moment the Yunnan plateau is left, *i.e.*, it loses Chinese looks.

"We are having a wet summer, much more wet than last year, and it is very unpleasant. The plague goes on apace. I tried to go out yesterday to the mountains, but had to return on account of the heavy rains. I stayed some little time at a Lolo village on the plain, and rested under a magnificent mulberry, the finest I have ever seen. It had the enormous spreading-on-the-surface-of-the-ground roots which I think is called Table-kind of root. I went in quest of a Lolo Pundit that I heard of, but we found his house and the compound deserted, as there had been three cases of plague, and the Pundit had fled. I hope to secure his services, but the Lolos are very shy, or rather, I think, are afraid to link themselves with Europeans, as the Chinese suspect them then of ulterior designs. The Lolos were allied as a rule with the Mahomedans in the rebellion of Yunnan, and there is no love lost between them and the Chinese.

"The different status of women amongst the Chinese and the races allied to them is a curious problem. Ancient Chinese poems don't show modern Chinese life at all. However, I must conclude."

"Yours very truly,  
(Signed) AUGUSTINE HENRY."

## DLXXXVII.—RUBBER AND COFFEE IN LAGOS.

The following extracts taken from the Annual Report for 1895 on the Colony of Lagos, West Africa (*Colonial Reports*, Annual, No. 185, 1896), contain interesting information respecting the progress of the rubber and coffee industries lately developed in that dependency.

The rubber industry was discussed in these pages two years ago (*K.B.* 1895, pp. 241-247 with plate; and 1896, pp. 76-77) while coffee planting in Lagos was the subject of a later article (*K.B.* 1896, pp. 77-79).

### RUBBER.

"By far the most important factor is the extraordinary development of the rubber industry, the statistics of which are almost incredible. On the Gold Coast we are told that the export of rubber, which in 1882 was *nil*, had attained in 1893 to the annual value of £200,000. Lagos, in 1894, shipped 5,723 lbs. of rubber to Great Britain, and 144 lbs. to Germany, in all 5,867 lbs., of the value of £324 6s. 4d. In 1895 these figures rose to no less than 5,069,576 lbs., of a total sterling value of £269,893.



"So far back as 1882, Sir Alfred Moloney, K.C.M.G., to whom is due the credit of starting the industry on the Gold Coast, had suggested the possibility of a similar industry in Lagos, but it was not until 1894 that any progress became apparent. In that year the Governor of Lagos, Sir Gilbert Carter, K.C.M.G., issued the following notice:—

"His Excellency the Governor desires to notify to the mercantile community of Lagos that he has been able to induce a party of natives from the Gold Coast, experienced in rubber collecting, to come to Lagos, with a view to the development of this valuable and important industry. The men have already inspected certain districts, which they report to be rich in rubber-producing plants, and it is confidently hoped that Lagos will shortly be able to compete with the sister Colony of the Gold Coast in the great export of the product."

"This confident hope was quickly justified. Merchants took up the idea with enthusiasm. With startling suddenness the easy-going native awoke to the fact that wealth abounded in the forests round him, and learnt for the first time that in sitting under his own fig tree he had been unconsciously reposing in the shade of the family bank.

"There is, unhappily, reason to fear that the usual result may follow this sudden discovery. Already there seem to be grounds for the belief that, in so far as the term 'rubber industry' implies the intelligent growth and cultivation of the plant for profit, it conveys a false impression of the methods in vogue in the interior.

"Judicious tapping with due regard to the life of the tree, and its future usefulness, is the exception; rubber-bearing trees are ruthlessly sacrificed by irresponsible seekers after wealth, and dead trunks are becoming a too familiar feature in the landscape of the productive districts. Sooner or later a purely destructive policy of this kind must exhaust the richest country; adventurers will have to stray further afield, and the cost of transport will equal or exceed the value of the article."

#### AGRICULTURE.

"The cultivation of coffee is still in its infancy in the Colony, but the Ilaro Plantation Company are continuing their operations with every prospect of success. The variety principally cultivated is the Liberian, but a few Arabian trees are being raised experimentally. The managers of the Ilaro Company report that they have 150 acres planted with 50,000 coffee and 6,000 cacao plants, while the Ajilete Company have over 60,000 of the former and are also turning their attention to the cultivation of cacao and kola nuts.

"A few yam or cassava farms surround almost every native village, but it is impossible to estimate the acreage so cultivated. Incidentally these small plots, in conjunction with a very nasty smell, serve the useful purpose of announcing to the traveller the proximity of human habitations. Besides the all-important palm oil and kernels, kola nuts, beniseed, ground nuts, and piassava are among the produce of the Colony."

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## DLXXXVIII.—BRITISH SOLOMON ISLANDS.

According to the *Colonial Office List*, 1897, p. 306, these islands were placed under British protection in 1893, and a Resident has lately been appointed. His head-quarters will be at Tulage, a small island which has been purchased for the purpose of establishing a Residency. The British or Southern Solomon Islands "consist of the Islands of New Georgia, Guadalcanar, Malaita, San Christoval and small islands in the vicinity of the above lying between the 7½th and 13th degrees of south latitude, and the 150th and 163rd degrees of east longitude. The natives are Melaneseans. They are treacherous, and most of them are cannibals. There are a few resident traders, mostly of British nationality. A large number of natives used to go to work in plantations in Queensland, Fiji, and Samoa, returning after the expiration of three years, but the number is less than formerly.

"The principal articles of trade are copra, pearl shell, and tortoise shell. The climate is not a good one."

During the last few years the botany of the Solomon Islands has been studied at Kew, and collections of dried plants have been received from the Rev. R. B. Comins, Dr. H. B. Guppy, and from the officers of H.M.S. "Penguin," communicated by Admiral Sir W. J. L. Wharton, K.C.B., F.R.S., Hydrographer of the Admiralty. The more interesting plants have been described in the *Annals of Botany* (vol. v. (1891), pp. 501-508, t. 27; vol. vi. (1892), pp. 203-210, tt. 11-14); *Journal of the Linnean Society* (vol. xxx. (1894), pp. 163-165 and 211-217, tt. 9-11); *Hooker's Icones Plantarum* (4th series, iii. (1894), tt. 2207, 2247, and 2248); and the *Kew Bulletin* (1892, 105; 1894, 211-215; 1895, 132-139, 159-161).

An account of the present condition of the Solomon Islands is contained in the *Colonial Reports* (Miscellaneous, No. 8, 1897) by Mr. C. R. Swayne, the first British Resident. The following information is extracted:—

"From inquiries instituted, both in Sydney and in the Protectorate, I find that the exports to Sydney for 1895 and for the present year will stand approximately as follows:—

Year.	Copra.	Ivory Nuts.	Pearl Shell.	Turtle Shell.	Beche de Mer.
	Tons.	Tons.	Tons. Cwt.	lbs.	Tons. Cwt.
1895	1,200	586	6 10	891	7 18
1896	1,383	610	8 9½	1,379	3 15

## COPRA.

"Copra always has been, and is likely for many years to come to supply, the chief article of export. Solomon Islands copra is what is known as smoke-dried and consequently does not command so good a price by from 10s. to 17. a ton in Sydney as sun-dried copra in consequence of its dirty appearance. I was, however, informed by an expert in Sydney that Solomon Island



copra is particularly rich in oil, and I see no reason why the more usual system of sun-drying should not be resorted to. From the natives' point of view smoke-drying is less trouble and they have become wedded to the practice, but should cocoanut-planting under white management be entered upon, it is not to be supposed that any system but sun-drying, or perhaps even the superior one of kiln-drying, would be followed.

"The output of copra from the Protectorate might be very largely increased. I have no hesitation in saying that with the existing trees at least double the quantity of native-made copra might be produced, and this without in any way stinting the natives in the quantity they require to use for food. The quantities of sprouting and wasted nuts that may be noticed at any time under a cocoanut grove in the Solomons is such as would make the mouth of a Samoan or Fijian water with envy. The fact is, however, that the natives have so few wants, and these are so easily supplied, that a small proportion only of the crop of nuts suffices to satisfy them, and the remainder is allowed to go to waste. I consider that of all the natives of the Western Pacific with whom I have come in contact the Solomon Islanders of the British Protectorate are able to supply their demand for articles of foreign trade with the least exertion.

"In preparing the copra for sale to the traders the natives cut the nuts in half and the divided nuts are then smoked in a fire. When sufficiently dry the cup-shaped kernels come away from the shell. These are strung upon strings supposed to contain 10 nuts each, or rather 20 half-nuts. The price for a string of copra supposed to contain 20 half-nuts is one stick of tobacco, or its equivalent, which costs the traders rather more than a half-penny. It is safe to assert that the strings of copra never contain the full number when tobacco is the purchasing medium. During my previous residence in the Solomons, from 1886 to 1889, strings containing 16 or 18 half nuts were considered very good, but during the present year I saw a string containing so few as seven half nuts tendered and accepted as a full string. In fact the natives are supplying their wants too cheaply, and the better class of traders have admitted to me that the imposition of duties or trading licenses will actually benefit the trade by forcing them to raise the price of their goods and so compelling the natives to make more produce.

"At the present price of copra in Sydney I consider that if a trader makes 2*l.* a ton profit upon the copra collected by him he has done very well, and off this must be taken the expenses of collection.

#### IVORY NUTS.

"These nuts are the fruit of a palm (*Metroxylon Amicarum*), one of the sago-yielding palms. The species is, I believe, peculiar to the Solomons, and grows wild throughout the group in inexhaustible quantity. The nuts are exported as vegetable ivory and are used for making buttons and similar small articles. Some years ago I made inquiries in London as to the market for these nuts, and ascertained that they were known in the trade as 'apple nuts,' and that three Birmingham firms occasionally used them. I was informed that the chief objection to them was the



hollow core through the middle, and their reluctance to take a black dye. More went to Germany and Vienna than to London. About three years ago the price of these nuts suddenly jumped from about 3/ a ton in Sydney to 12/., at which price a considerable quantity were sold, and the market probably overstocked. Their value has now relapsed to about 5/ per ton in Sydney, at which figure there seems to be a good demand. The sudden inflation in value was due, so I was informed, to the demand of a Vienna firm, who used a considerable quantity for making the wheels of roller skates.

"I consider that there will continue to be a demand for a fair quantity at about present prices, with perhaps occasional rises. Should the demand for these nuts increase, the quantity shipped could be very largely augmented.

#### AGRICULTURE.

"Under this head, I shall refer only to such enterprises as have been undertaken by white residents, native planting operations being of the usual kind to be met with in the Western Pacific. As a locality for the growth of the cocoanut palm, I believe the British Protectorate of the Solomons presents advantages unequalled by any place that I have hitherto visited in the Western Pacific. Situated as it is within the parallels of 7° to 11° of south latitude, it is outside the region of the devastating hurricanes that occasionally visit the New Hebrides, Fiji, Samoa, and Tonga, whilst it is also exempt from those long periods of drought that are experienced among the islands of the Gilbert group. The appearance of the miles of cocoanut palms fringing the beach on the north coast of the Island of Guadalcanar and along the shores of the Rubiana Lagoon and elsewhere in New Georgia prove that the climate and soil of the Protectorate are eminently suited to the production of cocoanuts. So far the only attempts by white men at cocoanut planting have been by the owner of Gera Island, off the coast of Guadalcanar, by the Marau Company at Crawford Island in Marau Sound, by the same company upon a piece of land of about 30 acres on the mainland at Aola on Guadalcanar, and by Mr. Neilson, the trader, at Gavutu, upon his island of that name. The plantations of the Marau Company are at present too recent to have yet come into bearing, but at Gavutu, where, when I left in November, 1888, no palms had been planted, there is now a plantation of about 15 acres in full bearing. I can safely say that, in spite of the fact that the trees cannot be more than seven years old, I never saw cocoanut palms bearing more heavily, and this is the case not with selected trees but with the whole plantation. They are planted in lines at a distance of 30 feet by 30 feet, a system which gives nearly 50 trees to the acre. The Marau Company have lately acquired the two uninhabited islands known as North Island and Symonds Island, near Marau Sound, and are at present clearing them with a view to cocoanut planting.

"There are hundreds of small low flat islands throughout the Protectorate composed of sand and decomposed coral with a covering of vegetable humus most eminently suited for cocoanut planting, among which I may mention the long reef islands extending along the south coast of Malaita and several islands along the northern coast, especially the large island of Leile,



which has been vacated by the natives ever since the attack upon the labour ship "Janet Stuart," several islands and bays at the west side of Russell Island quite deserted by the natives through fear of the New Georgia head-hunters, numberless uninhabited and most fertile islands in the Marova Lagoon, the whole of Gizo Island and adjacent islets, quite uninhabited, and numerous small islands near Wana-Wana. The Marau Company have within the last two or three months commenced work upon a large block of land purchased by them on the north coast of Guadalcanar about six miles from Marau Sound. The situation appears to have been well selected, the land being of the first quality. It is proposed to grow cacao, coffee, both Arabian and Liberian, Vanilla, and other products. Seedlings of the two former have been raised at the Company's head station at Marau Sound and were being removed to the plantation at the time I left the Protectorate in October.

"The Company have had some difficulty in procuring seeds of cacao, although the tree had been introduced to the Solomons some years ago by the late Mr. Stevens of Ugi. I found about a dozen trees growing in the trader's garden at Ugi in sour undrained soil. They appeared quite neglected, and although bearing fairly well appeared to be badly diseased. For this reason Mr. Svensen of the Marau Company had been unwilling to use seed from these trees. Upon a closer examination, I found their sickly appearance due to the ravages of the wood-boring larva of a large species of longicorn beetle. It appeared to start its attack near the ends of the young branches and work downwards through the heart of the branch. The branches affected quickly responded to the attack of the larva by presenting an unhealthy appearance, so that I think that in a properly tended plantation there would be no difficulty in keeping the trouble in check by pruning.

"The Marau Company is also planting bananas with a view to shipment, and it is expected that the first shipment will be made about the middle of 1897. As Marau is one of the last places of call of the steamer "Titus" and the voyage to Sydney is made from that place in from seven to eight days, it will be seen that the east end of Guadalcanar is as favourably situated as Fiji or Queensland for supplying the Sydney market. The trader Sheridan, at Makira Harbour on San Christoval, also announced to me in June his intention of planting bananas for export, and I believe a commencement has already been made.

"Mr. Maben, at present a visitor to the Protectorate, will probably embark in the enterprise of coffee planting.

#### INDIA RUBBER.

"During the present visit to the Protectorate I made several experiments with a view to the production of india rubber, the trees experimented upon being chiefly various species of parasitical *Ficus*. I regret to say that my experiments were unsuccessful. I was, however, shown by one of the Aola traders, who had just returned from British New Guinea, some samples of rubber now being procured there by the natives. The man who showed me the samples said that he had seen the same tree as that from which they were produced growing in the Solomons, and from

his description it appears to be also a species of *Ficus*. The natives of New Guinea, the trader told me, allowed the sap of the tree to run over their arms and body and when it was sufficiently solid removed it and rolled it up into lumps. The lumps were rather larger than a cricket ball and it was worth to the New Guinea traders from 2s. 6d. to 3s. per lb.

#### SAGO.

"A species of sago palm grows wild throughout the Solomon Group in inexhaustible quantities, the nuts being exported as vegetable ivory, as described above. So far no attempt has been made to utilise the sago contained in the pith of the tree. The natives of Shortland Island and Treasury Island understand the extraction and manufacture of the sago flour and it is extensively used by them as an article of food. They wash the pith in salt water and bake the resulting sago into cakes wrapped in leaves, frequently with the addition of pounded almonds. These cakes, as I can testify, are most excellent and sustaining food. From their portability, they are taken by the natives upon canoe voyages as they are not liable to damage by salt water and, moreover, are most convenient to sit upon. In the more eastern portions of the group the natives do not understand the manufacture of the sago, but in times of scarcity they bake lumps of the pith itself, and they tell me it is not unpalatable food.

"During my stay this year at Ugi, while waiting for the return of H.M.S. "Pylades," I made experiments in the manufacture of sago. I selected a tree which was just sending up its spike of flowers and with an axe made an incision in the trunk from which I chipped out about a bushel of the soft white pith. This I carried to a stream and grated up the lumps of pith in a bucket of water. I poured the resulting milky water through a piece of muslin into another bucket and allowed it to settle. The sago quickly settled on the bottom, when I poured off the water and removed the sago and dried it in the sun. I took the sample with me to Sydney, and was told that as starch alone it would have a value of at least £8 to £10 per ton. Even at this low price it might pay to manufacture on a large scale. The trees are in great quantity and a small apparatus for grating the pith, worked by water power, and wooden settling troughs might be erected at very trifling expense. But apart from any commercial value it may possess, the natives should be taught its use as food."

#### CANES.

"Canes suitable for making baskets occur everywhere in the bush and reach a great length. Some have lately been sent to Sydney in consequence of an inquiry for them.

#### TIMBER.

"Sandal wood has never, so far as I know, been found in the Solomons, but a very dark wood resembling ebony is found in fair quantities on New Georgia, and would probably be valuable for cabinet making."



## DLXXXIX.—SHINIA IN CYPRUS.

*(Pistacia Lentiscus.)*

In 1896, specimens of plants known in Cyprus as "Shinia" and "Mastiches" respectively, were received from Mr. A. K. Bovill, Principal Forest Officer in Cyprus. The first-named was determined to be typical *Pistacia Lentiscus*, and apparently identical with the plant yielding the Gum Mastich of the Greek Archipelago, chiefly in Chio (the modern Scio). The "Mastiches" was regarded as simply a broad-leaved variety of the same species. In some localities in Cyprus the trees of *Pistacia Lentiscus* are tapped, "but the gum which exudes is without colour and without taste." The trees yielding mastich in Scio are said to be exclusively *male*. According to Mr. Bovill, the Shinia "grows more or less all over Cyprus, from the sea-level to an altitude of 2,500 feet, and most luxuriantly through the Carpas, all along the northern shore of the island as far as Ryrenia, all over the Rormakiti Cape from Lefka to the village of Peyia, and from Rouklia, in the Paphos district, all along the southern coast to Mazoto, in the Larnaca district. Practically speaking, the supply is unlimited, for as fast as it is cut down it shoots up again from the stools.

"Mr. Christian, of the Cyprus Company, Limited, Limassol, writing to me on the subject, says:—'We have been for some years past trying to find a market for this article, and have succeeded in introducing it to one or two firms in the north of England, but thus far the demand for it is limited, and does not exceed 100 to 150 tons per annum. Like Sumach, the Shinia leaves contain tannic acid, but to a less degree, and the material has been found of value for fixing dyes. . . . Our buyers prefer to have the Shinia in the leaf, and we have therefore ceased grinding it, and now ship it in pressed bales.' He adds, 'I feel confident that a large demand would grow up for this product should its qualities become more widely known, but unfortunately it is extremely difficult to persuade English manufacturers to try new products.'"

Further information is contained in the following correspondence received from the Government of Cyprus:—

THE CHIEF SECRETARY, CYPRUS, to ROYAL GARDENS, KEW.

Chief Secretary's Office, Nicosia.

SIR,

January 6, 1897.

I HAVE the honour to transmit to you a copy of a report which has been prepared by Mr. Gennadius, the Director of Agriculture, dealing with the cultivation of Shinia leaves.

I shall have pleasure in forwarding to you copies of similar pamphlets as they appear, relating to agricultural or economic subjects.

I am, &c.,

(Signed) ARTHUR YOUNG.

Chief Secretary.

The Director,  
Royal Gardens, Kew.

## REPORT ON SHINIA LEAVES.

*Pistacia Lentiscus* is the shrub that grows abundantly in most parts of Cyprus, and is called in the island *Shinia*. A cultivated form of this *Shinia* which is so commonly met with here is the mastic shrub of Chio (the modern Scio). The leaves only of the *Shinia* have a commercial value, as they serve as a tannic and dyeing substance.

From the wood of this shrub charcoal of good quality is made, and from its seed, which is eaten readily by goats and pigs, oil can be extracted which would be good for burning purposes, and could, in case of necessity, be used for food as well.

For some time *Shinia* leaves were exported from Cyprus to England by the Cyprus Company, but they were exported in small quantities, and, as I understand, the price that was paid to those who collected them was 8 paras per oke.

But the principal market for *Shinia* leaves is Palermo, in Sicily, to which there is an annual exportation from Tunis of about ten thousand tons. The *Shinia* leaves serve at Palermo, chiefly, for the adulteration of Sumach (*Rhus Coriaria*),\* which is grown in large quantities in Sicily, and is exported to England and France, principally through Palermo.

A good quantity of *Shinia* leaves is also consumed at Lyons, France, as a dyeing material for silk stuffs.

The course, then, we must pursue, is to get the *Shinia* leaves, of which there is an abundant yield in Cyprus, into those two markets.

Dry *Shinia* leaves are bought at Tunis by Italian merchants at  $2\frac{1}{2}$  francs (2 shillings) for every 100 kilogrammes (78 okes), and being packed in sacks, are sent to Palermo, where they are sold at  $4\frac{1}{2}$  to 7 francs ( $\frac{3}{7}$  to  $\frac{5}{7}$ ) for every 100 kilogrammes.

The *Shinia* leaves are collected from the month of April to the month of September. For that purpose the leafy branches of the shrub are cut off and laid in heaps on the ground and left there until they dry. Usually they dry in four or five days, during which the heaps are not disturbed, so that as few leaves as possible should come into direct contact with the sun, whose effect is to bleach and overdry them, thus depreciating their value.

After being dried, the branches are beaten with the flail, so that the leaves get detached; the leaves are then placed in sacks and brought to the market for sale. Before the beating takes place, the top branches which cover each heap are removed and thrown away, because the leaves of those branches being bleached and burnt by the sun, are not only useless but also become injurious when they are rubbed and mixed with the rest of the produce. *Shinia* leaves should not be collected after rain, because then a produce of inferior quality is obtained.

P. G. GENNADIUS,

Director of Agriculture.

9th December, 1896.

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\* See *Kew Bulletin*, 1895, p. 293.



## DXC.—SLIME-FLUX.

An obscure disease, which appears to be very destructive to young fruit-trees, has been recently the subject of careful investigation at Kew. Originally described by Ludwig in 1888, it is briefly discussed in Tubeuf and Smith's *Diseases of Plants* (1897), who express some doubt as to the organism causing the disease and as to its fatal character. The following account, however, seems to leave little room for doubt in the matter :—

REPORT on a diseased plum tree sent to Kew for examination by, Spencer Pickering, F.R.S. Mucilage-flux ; Schleimfluss, or L'Écoulement des Arbres fruitiers.

The colourless mucilage escaping from injured portions of diseased plants contains a Schizomycete—*Micrococcus dendro-porthes*, Ludwig ; this appears to be invariably accompanied by the early, aquatic condition of a fungus (*Torula monilioides*, Corda), the subglobose cells of which float in the hyaline mucilage, and impart to it a brown colour. Inoculations with pure cultures of both these organisms demonstrate conclusively the following points :—

(1.) The *Micrococcus* is alone capable of inducing fermentation in the living wood of the host-plant, and must, therefore, be considered as the active agent in causing disease.

(2.) The *Micrococcus* is not able to set up a disease when placed on uninjured bark, however young, but does so readily and constantly when placed on a wounded surface of wood or bark.

(3.) The disease is quite as readily imparted to apple trees as to plum trees.

Shortly after inoculation the diseased portions of wood assume a reddish-brown colour, and finally become quite soft and disorganised. At a later stage scattered patches of bark are destroyed from within, forming suppurating wounds through which the mucilage, formed during fermentation of the tissues, oozes to the surface.

Such wounds present very suitable starting-points for the growth of various wound-fungi, as *Polyporus*, *Nectria*, etc.

The mucilage, charged with *Micrococcus* and *Torula*, situated on the surface of the bark, is readily dispersed by wind and rain, field-mice and other rodents, work-tools, etc., access being gained to the living tissues of the host-plant through wounds such as broken branches, eroded bark, and insect punctures. In the example sent to Kew for investigation, inoculation had taken place at the surface of two pruned branches, which presumably had not been properly protected by the application of tar to the cut surfaces.

G. M.

August 12, 1897.

## DXCI.—MISCELLANEOUS NOTES.

MR. RICHARD MENTZEL, formerly a member of the gardening staff of the Royal Gardens, has been appointed manager of the rubber plantations of Mr. Wolf Carlis, at Johannesburg, South African Republic.

MR. HORACE WALTER LEIGHTON BILLINGTON, Curator of the Botanic Gardens (Station) at Old Calabar, in the Niger Coast Protectorate, died in November, the news reaching London on the 19th. He was youngest son of the Rev. J. H. Billington, rector of Chalbury, Dorset. After spending three years in the service of the Royal Niger Company, he entered that of the Government in the Niger Coast Protectorate. Arriving in Old Calabar on March 20, 1893, he created under Sir Claude Macdonald "the botanic station that he was just starting, for the purpose of ascertaining what economic plants were suitable for cultivation in the Protectorate, and to encourage the natives to grow them, as well as an example for them to see how useful plants should be planted and grown."

His first report, from which the above is quoted, was made to the Commissioner and Consul-General, February 24, 1894. It is printed in the papers (Africa, No. 1) presented to Parliament in 1895. It includes a remarkable list of the economic plants which Mr. Billington had succeeded in gathering together, many having been obtained from the West Indies, as well as the other West African stations.

A scheme for the establishment of the station had been presented to the Foreign Office by Kew in 1891, at the request of the Marquess of Salisbury. The objects which Sir Claude Macdonald hoped to obtain through it are quoted in the *Kew Bulletin* for 1895 (p. 164).

Besides the report on the station, the papers also contain a report by Mr. Billington on the botany of the country lying to the eastward of the Old Calabar River, and a similar report of the bank of the Cross River.

Mr. Billington had borne the climate remarkably well, but he resigned in July of last year, and was only awaiting the appointment of his successor to return to England. His untimely death at the early age of twenty-eight closes a career of much usefulness and promise. But as the pioneer of new cultural industries in the Niger Protectorate it may be hoped that his memory will long be preserved.

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**Botanical Magazine for November.**—*Mammea americana*, a native of the West Indies, is cultivated in tropical America for the sake of its edible fruit, the mammee apple. The plant in the Economic House at Kew flowered in 1896, but did not produce fruit; the figure of the latter was therefore prepared from a specimen in the Museum, which had been received from C. D. Sturge, Esq., of Montserrat. *Tainia penangiana* was communicated to Kew by Mr. C. Curtis, F.L.S., of Penang. It has pale yellow sepals and petals, each with five to seven red nerves, and a nearly white lip. *Cynorchis grandiflora*, from Madagascar, has rather pretty flowers, and all the green parts of the plant are streaked with blood-red. The plant figured was obtained from Messrs. Lewis & Co., of Southgate. *Drimys Coleae* is a new species, flowered at Kew from a bulb brought from Somaliland by Miss Edith Cole. *Scoliopus Bigelovii* is a singular liliaceous plant from California. The flowers give off an odour resembling that of decaying sea-weed.

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**Flora of British India.**—The completion, by the issue of the twenty-second part, of this important contribution to our knowledge of the existing vegetation of the world was announced above (pp. 205, 206). A general index to the whole work was published in November last.

**Pelican.**—The specimen of *Pelicanus onocrotalus* presented to Kew in 1896 by the Zoological Society (*K. B.*, 1896, p. 98) unfortunately succumbed to an incurable disease in the following winter. The remaining bird, also of the same species, had been given to the Royal Gardens in 1890 by the late Lord Lilford. It had become extremely tame and a very popular pet with the visitors.

Although from time to time feather-pinioned, during 1897 it eluded efforts to catch it. In October last it flew away to the Thames, and for some time established itself on the reservoir of the West Middlesex Waterworks, at Barnes. All attempts to recapture it were unfortunately unsuccessful. It was also heard of at Southall. It eventually left the Thames valley and flew southwards.

Mr. D. N. Olney, of Blenheim House, Robertsbridge, Sussex, was so good as to send to Kew the following "cutting" from the *Kent and Sussex Post* of October 16, which records the fate of the unfortunate bird. This will, at any rate, serve to commemorate the hospitality to an interesting visitor of Mr. Percy Tew, his game keeper, and the "sagacious animal" Jock :—

"On Saturday last a huge bird was seen in Brightling Park, and observed to settle in the Saw Mill pond and drink copiously, as though famished. It took little notice of persons watching it, and the keeper, Mr. Hewett, arriving shortly, shot it in the middle of the pond. On sending his dog to fetch it out, 'Jock' appeared to shy at such big game, but after a few minutes and plenty of encouragement the sagacious animal seized the bird by the neck, and, placing his body under it, swam ashore with it on his back, much to the amusement of those who witnessed it. The bird is a splendid specimen of the pelican tribe, in fine condition and plumage, measuring 9 feet 10 inches from tip to tip of wings, 5 feet 9 inches from beak to tail, and 3 feet round the body. The bill was 15 inches in length and opened to a width of 17 inches. Weight 21 pounds. We hear the bird has been sent to Percy Tew, Esq., the owner of the park, who will no doubt have it preserved as a curiosity, and certainly a rarity in this part of the world."

A portrait of the pelican was given in the *Gentlewoman* for November 13, from a photograph taken at Kew by Mr. Alfred Craske.

**Importation of Canadian Fruit.**—The exhibition of Colonial fruit at the Colonial and Indian Exhibition in 1886, which was due to the initiative of the Royal Horticultural Society, led to the publication of a series of papers, the result of official enquiries directed by the Secretary of State for the Colonies, in the *Kew*

*Bulletin* for 1887 and 1888. The report on Canadian fruit is one of the most important, and is contained in the number for November, 1887 (pp. 4-20). The following passage (p. 19) may be quoted as the historic foundation of what bids fair to become an important commerce :—

“The experience gained during the recent Colonial and Indian Exhibition in London has shown the importance of cold storage\* in the transportation of fruit, especially of the early ripening sorts, and it is desirable that facilities in this direction should be offered to the fruit growers of Canada, so as to stimulate the export of autumn fruits.”

The following extract from the *Standard* for September 25 (1897) gives the sequel ten years after :—

“An interesting experiment is being carried out by the Canadian Government, with the view of taking full advantage of the fruit-growing capabilities of the dominion, and putting the best qualities of Canadian “soft” fruits on the English market in competition with the products of Californian orchards. By “soft” fruits are meant in the trade such produce as the best class of table pears, peaches, grapes, and tomatos, and the first cargo reached Covent Garden yesterday, where it was put on sale by Garcia, Jacobs and Co. The Canadian Government have subsidised, under the system they propose to use, the owners of seventeen steamers running to London, Liverpool, Bristol, and Glasgow from Canadian ports, though chiefly from Montreal, to carry the fruit, and have fitted up on the vessels the latest types of refrigerators, in which to stow the goods. The steamship companies are bound under their agreements to carry the fruit at ordinary rates, with only an additional charge of 10s. per ton for the use of the refrigerators. The export of Canadian apples to this country has been a great success, but the import of the best class of pears, for instance, has not been a success. These pears are of the Williams variety, though known in Canada and the States as Bartletts, and are all from sound English stock. The first consignment consisted of 880 cases of pears, peaches and tomatos, and were shipped to Bristol by the steamer “Merrimac.” The ship arrived yesterday morning, and the cargo was despatched in time to be disposed of at Covent Garden in the afternoon. The quality was described by the experts as excellent, both the William pears and the peaches being very fine, but the system employed in packing is such as would prevent the proper ventilation of the contents of the cases. As a result, some of the fruit was more or less out of condition. Mr. Crandall, the representative of the Canadian Minister of Agriculture, inspected the fruit, and was much interested in the opinions expressed in the market as to the need of improved packing. There is no reason to doubt that the Canadian Government officials will take steps to instruct the producers as to a better method of packing. The best to follow is the system employed by the Californian shippers, and there should then be a good sale on the English markets of Canadian produce, especially as it can be brought here at a less cost than the greater part of the fruit from France. Considering the condition of the fruit, the prices realised were regarded as very satisfactory.”

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\* See also *Kew Bulletin*, 1896, pp. 33-36.



**Fruits from Grenada in New York.**—The following extract from *Garden and Forest* (New York) for November 17, 1897, affords an illustration of a possible market for the minor products of the lesser West Indian Islands :—

“An interesting collection of tropical fruits reached this city recently from the Botanic Gardens in *Grenada*, a British possession, the southernmost island in the Windward group. The consignment was shipped on October 23rd. A delay of ten days in entering the fruits at this port, due to the unusual character of the invoice, and the want of established rates of duty, proved fatal to many of the more perishable kinds, but enough survived to give distinct character to the select stock in one of the fancy fruit stores on Broadway. These West Indian fruits included especially juicy oranges of excellent quality. The tangerines and mandarins were superior, and sold, as did the oranges, at \$1.03 a dozen. Among other citrus fruits were lemons ; these were less attractive, being of uneven size, thick-skinned and rough. The limes were remarkably good, and sold for forty cents a dozen. An unusual offering in this city were citrons, the fruits of *Citrus Medica*, familiar to housekeepers in their candied peel : there were under-sized green fruits, and mature ripe specimens ; the latter, cut with a piece of the stem, were lemon-shaped, large as grape-fruits, the rough skin unevenly coloured in shades of lemon and orange. These sold for twenty cents each. In this unique collection, sapodillas, the fruits of *Achras Sapota*, were fortunate in showing to better advantage for the long time consumed in reaching customers, since these are at their best when more than fully ripened, and the grayish earth-coloured globular fruits were in the juicy sugary stage. They sold for fifteen cents each. A single specimen of the brownish yellow fruit of *Lucuma mammosa* was exhibited, and some of the large brown nuts. Alligator pears were among the fruits lost through the delay, and the few bananas which were yet edible were remarkably good in quality, the yellow fruit of medium size having a rich, creamy-white flesh, while the red bananas were of especially fine flavour. The latter, one of the most rare of all fruits in this market, since the supply was cut off by the Cuban war, found eager purchasers at \$1.00 a dozen. Several bundles of stick cinnamon also sold readily.

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**Victoria Herbarium.**—At the close of 1896, the Government of Victoria appointed Mr. J. G. Luehmann, F.L.S., Curator of the “National Herbarium” at Melbourne, in succession to the late Sir Ferdinand Mueller, K.C.M.G., whose death on October 9th, 1896, was recorded in the *Kew Bulletin* for that year (pp. 218, 219). The Melbourne Herbarium, which is termed national in common with other institutions under the same minister, must always be the leading botanical institution in Australasia. It comprises the collections made during a long series of exploring expeditions on the continent of Australia, besides innumerable contributions from external sources, especially Kew, acquired through the indefatigable activity in correspondence of Sir Ferdinand Mueller, the late Government Botanist. On the occasion of the Melbourne Centennial Exhibition, in 1888, he published an interesting account of the Herbarium. A building was erected for its reception in 1857, when Sir Ferdinand presented to it all his

private collections formed since 1840. In 1884, the Victorian Government acquired, by purchase, and added to it the Herbarium of Dr. Otto Wilhelm Sonder, of Hamburg, one of the authors of the *Flora Capensis*, who died in 1881.

The Melbourne Herbarium is of peculiar value from a scientific point of view. It contains the authentic types of all the vast number of Australian and other plants described by Sir Ferdinand Mueller during a long period of incessant and prolific labour. The value of the Australian collections is still further enhanced by their having been successively transmitted to Kew for the use of Mr. Bentham during the preparation of the *Flora Australiensis* (1863-78). In the preface to the last volume of that work, Mr. Bentham writes:—"He [Sir Ferdinand Mueller] has regularly transmitted to me, arranged for each volume, the vast stock of Australian specimens collected by his own exertions, as well as by the able collectors he has employed, and the numerous residents and other correspondents whom he had inspired with a love for the science. . . . The specimens, having been worked up, have been successively returned, and the numerous consignments have reached Melbourne without a single loss."

The Australian collections have thus a double authenticity. Taken as a whole, it cannot be doubted that the Melbourne Herbarium, to use the words of its distinguished founder, to whom it may be hoped it will ever remain as an enduring monument, is "on a par with the very few really grand herbaria in existence."

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**White Willow.**—A note on the Huntingdon or White Willow (*Salix alba*, L.) has already been published in the *Kew Bulletin* (1895, pp. 239-40). It was pointed out that the demand for the timber was so great that there was great difficulty in procuring suitable wood, especially for making cricket bats. The following additional information on the subject is taken from the *Timber News*, of October 9, 1897:—

"It is not to be wondered at that the best quality of willow timber suitable for the manufacture of cricket bats has of late been selling at prices never dreamt of in the days of our forefathers. From 2s. 6d. to 5s. per cube foot has quite freely been given for 'maiden' (unpollarded) willow timber, if of sufficient dimensions for the making of the best class of bats; and it is little wonder that such paying prices have tempted owners of goodly-sized trees to have these placed on the market, as well as the owners of damp and not too valuable land to speculate in planting so rapid-growing and valuable a timber tree. Only this week fully 100 trees of 'maiden' willow were to be disposed of by tender at Wickham Hall, in Essex, and it is pretty certain that competition was unusually keen, and the money offered comparatively high. We at present know of three buyers of good clean willow timber, the price not being so great an object as the particular size and quality of the wood, which, for the special purpose of cricket bats of the first quality, must be without spot or blemish. We have sold large quantities in bygone days of willow timber for the purpose of converting into boarding for the bottoms of carts used in the conveyance of stones or brick, the wood having the valuable quality of tearing out rather than



splintering. But at present little, unless of very second-rate quality, goes for that purpose, the bat industry swallowing up every bit that can be procured. Fortunately, the cricket bat manufacturer is not wholly dependent on British-grown willow, much of excellent quality being sent from various parts of the Continent.

"When we consider that the first quality of willow timber can be grown on land that would be too damp for the ordinary farm crop, that plants and cuttings can be got at a very nominal rate, that the tree is not subject to disease, at least to any great extent, grows with great rapidity, and is perfectly hardy, added to which is the commercial value of the timber, it is not surprising that farmers and landowners have been turning their attention to it of late, and that already a goodly acreage is now under that crop in various parts of the country."

**Calostemma album**, R. Br.—In the *Kew Bulletin* for 1892 (p. 72) the introduction to Kew is recorded of bulbs of this rare and interesting Amaryllid. They were forwarded by the late Sir F. von Mueller who had received them from the Hon. J. Douglas, C.M.G., by whom they had been collected whilst on a visit to Turtle Islands. They flowered at Kew in 1894, and proved to be *Eurycles sylvestris*. On being informed of this, Sir F. von Mueller took steps to secure bulbs of the true *Calostemma*, and forwarded some to Kew in 1895. These flowered in September this year and again prove to be the *Eurycles*. Mr. F. M. Bailey, Colonial Botanist, Queensland, writes:—"July, 1897. I have lately been over Thursday Island, and, although I looked carefully, I could not find the *Calostemma* . . . . I fancy *Eurycles sylvestris* was sent for it."

Nothing seems to be known of this interesting species since it was collected in 1803 by Robert Brown, on Flinders' voyage. It was figured from specimens collected by him in the Kew Herbarium in *Hooker's Icones Plantarum*, t. 2371.

**Assam rubber in Egypt**.—The following correspondence gives the promising result of an attempt to produce rubber from *Ficus elastica* in Egypt:—

Mr. FLOYER to ROYAL GARDENS, KEW.

SIR,

Cairo, May 2, 1897.

THANK you very much for the seeds of *Ficus elastica*. I have put in this spring some 50,000 cuttings, and about 96 per cent. are doing well, owing to favourable weather. But, according to Indian experience, the tree does better from seed.

We need millions of trees as shade for the new agricultural roads, and some of them may well be rubber producers, in view of the fact that the present supply is obtained in great measure through the destruction of the trees.

The trees here yield more freely than those of the Chardwar experiment. I have posted a small sample of the India-rubber. The product is very uniform, and a small sample is as good as a large one.

Will send you shortly some gutta from *Calotropis*.

Yours, &c.,

(Signed) ERNEST A. FLOYER.

MESSRS. HECHT, LEVIS, and KAHN TO ROYAL GARDENS,  
KEW.

21, Mincing Lane, London, E.C.,

DEAR SIR,

May 19, 1897.

WE have your favour of yesterday ; also a sample of rubber. It is equal in quality to the fine Darjeeling Assam, and if it comes here exactly like this sample, equally strong and pure, it would at the present moment sell at 2s. 6d. per lb., and such rubber could be readily sold at any time.

Always at your service, we are, dear Sir,

Yours, &c.,

(Signed) HECHT, LEVIS, and KAHN.

*Laportea canadensis*.—A nettle-looking plant was received last year from the *Jardin d'Acclimatation* at Paris, under the name of *Bæhmeria candicans*. It was said to afford fibre superior in quality to China-grass (*Bæhmeria nivea*), or rhea or ramie (*B. tenacissima*), and its cultivation has been recommended in Southern France, Algiers, Egypt, &c. Fortunately, the plant on arrival at Kew was in excellent condition and in flower. Upon examination it was found to be not a species of *Bæhmeria*, but a well-known new-world species, *Laportea canadensis*, extending from Canada to Florida and Mexico, and westward to the Rocky Mountains. The fibre yielded by this plant was at one time largely used ; latterly it has been almost entirely forgotten. In Hooker's *Flora Boreali-americana*, Vol. II. (1840), p. 142, it is stated, "the fibre of the stem is copious and strong, and Mr Whitlaw endeavoured to recommend it to this country as an article of commerce." Later, in 1865, the Abbé Provancher refers to it in his *Flore Canadienne*, p. 516, under the name of *Ortie du Canada*, or Canada Nettle, and adds :—"Sa culture a été tentée en Europe pour sa fibre, mais ses avantages réels sont encore doutés."

It is well known that many members of the nettle order are capable of yielding fibre. Even the common English stinging nettle (*Urtica dioica*) is a very ancient fibre plant, its inner bark affording a tough fibre suitable for many purposes, and used for cordage and coarse cloth. A lace parasol cover partly made from this fibre is in Museum I., Case 102. A series of yarns prepared from the same plant, and variously coloured, were brought to Kew by Mr. B. Gray, of Glenanne, Ireland.

In the *Descriptive Catalogue of Useful Fibre Plants of the World*, by Mr. C. Richards Dodge, recently issued by the United States Department of Agriculture, the following note (p. 213) appears respecting *Laportea canadensis* :—"The fibre of this species, before the introduction of cotton, had an application more extensive than at present in Europe, where, particularly in Germany and in more northern countries, they manufactured the cloth called *ortica* (German, *nesseltuch*), or nettle cloth."

It may, therefore, be safely assumed that the Canada nettle possesses no special merit as a fibre plant compared with China-grass or ramie. Further, as it possesses stinging hairs, it is difficult to handle.



## INDEX.

## A.

- Aberia Caffra, as a hedge plant, 114.  
 Abyssinian dried plants, 241.  
 Achyranthes breviflora, *Baker*, 280.  
 — *Carsoni*, *Baker*, 280.  
 Acrocomia sclerocarpa, 337.  
 Acrostichum (Elaphoglossum) subsessile, *Baker*, 300.  
 Æschynomene dissitiflora, *Baker*, 259.  
 — (*Ochopodium*) nyikensis, *Baker*, 259.  
 — — sparsiflora, *Baker*, 259.  
 Agave Bouchei, 403.  
 — *Haseloffi*, 206.  
 — *kewensis*, 207.  
 Agricultural depression, 217.  
 Agrostis continuata, *Stapf*, 290.  
 — *fissa*, *Stapf*, 289.  
 — *griquensis*, *Stapf*, 290.  
 — *natalensis*, *Stapf*, 290.  
 — *Volckensii*, *Stapf*, 289.  
 Albuca (Falconera) Adlami, *Baker*, 285.  
 — — nyikensis, *Baker*, 286.  
 Algæ in the Kew Herbarium, 171.  
 Alsophila Batesii, *Baker*, 299.  
 Ammophila arundinacea, 211.  
 Anastatica hierochuntica, 210.  
 Andropogon Sorghum, var. saccharatum, 173.  
 — (—) trichopus, *Stapf*, 287.  
 Anthoxanthum madagascariense, *Stapf*, 287.  
 Anthericum (Trachyandra) malosanum, *Baker*, 285.  
 — (*Dilanthes*) Whytei, *Baker*, 285.  
 Antigua, report of Royal Commission, 384.  
 Appointments, 84, 109, 240, 333, 423.  
 Argentine palm kernels, 337.  
 Argyrolobium ? deflexiflorum, *Baker*, 253.  
 — leucophyllum, *Baker*, 253.  
 — longipes, *N. E. Brown*, 254.  
 Aristea nyikensis, *Baker*, 281.  
 — zombensis, *Baker*, 282.  
 Aristolochia clypeata, 109.  
 Arōids at Kew, 235.  
 Asclepias curassavica as an insectifuge, 338.  
 Aseroe rubra, plate facing p. 115, 136.  
 Assam rubber in Egypt, 429.  
 Asteriscus pygmæus, 210.  
 Athrixia stenophylla, *Baker*, 270.  
 Australian Myrmecophilous plants, 86.  
 Avena caffra, *Stapf*, 293.  
 — longa, *Stapf*, 292.  
 — muriculata, *Stapf*, 291.  
 — *Newtonii*, *Stapf*, 291.  
 — *Rothii*, *Stapf*, 292.  
 — *turgidula*, *Stapf*, 293.  
 B.  
 Bahama grass in Brit. Guiana, 209.  
 Balsamodendron Myrrha, 98.  
 Bambuseæ of British India, 110.  
 Bandoline wood, Chinese, 336.  
 Banks, Sir Joseph, Journal of, 85.  
 Barbey, W., Abyssinian dried plants, 241.  
 Barbados, report of Royal Commission, 360.  
 Begonia Baumannii, 241.  
 Belmontia divaricata, *Baker*, 274.

- Bent, J. T., death of, 206.  
 — — —, Socotra dried plants, 242.  
 Berkheya Adlami, 109.  
 Berlinia densiflora, *Baker*, 265.  
 Bignonia buccinatoria, 109.  
 Billington, H. W. L., death of, 424.  
 Bixadus sierricola, 179.  
 Blæria microdonta, *C. H. Wright*, 272.  
 Borers in Castilloa elastica, 177, 186.  
 Botanic Station, Old Calabar, 113.  
 — —, Sierra Leone (with plan), 303.  
 — Stations, W. African, employment of Curators on leave, 329.  
 Botanical Departments, staffs of, Appendix III.  
 — enterprise in West Africa, 329.  
 — exploration in Yunnan, 99, 407.  
 — Magazine, 84, 109, 110, 169, 206, 207, 241, 301, 333, 403, 424.  
 Botrytis corolligena, plate facing 115, 159.  
 Bouteloua oligostachya, 224.  
 Brachytrypus membranaceus, 188.  
 British Central Africa, Flora of, 170.  
 — Guiana, fodder plants in, 209.  
 — —, report of Royal Commission, 356.  
 — India, Bambuseæ of, 110.  
 — —, completion of Flora of, 205, 425.  
 — Solomon Islands, 416.  
 Bromeliaceæ at Kew, 230.  
 Broom corn, 173.  
 — root, 172.  
 Butter and tallow tree of Sierra Leone, 320.
- C.
- Cacao from Gold Coast, 326.  
 Cacoucia Barteri, *Hemsley*, 267.  
 Calathea rufibarba, 403.  
 Calostemma album, 429.  
 Canadian fruit, importation of, 425.  
 Canaigre, 200.  
 Canna disease, 173.  
 Cape bulbs at Kew, 231.  
 — Flora, 226.  
 — fruit industry, 191.  
 Carica Papaya, 104.  
 Cattleya elongata, 301.  
 Celosia chenopodifolia, *Baker*, 276.  
 — cuneifolia, *Baker*, 276.  
 — loandensis, *Baker*, 277.  
 — minutiflora, *Baker*, 277.  
 — nana, *Baker*, 277.  
 — pandurata, *Baker*, 276.  
 — semperflorens, *Baker*, 277.  
 Ceriops candolleana, 91.  
 Ceropegia fusiformis, *N. E. Brown*, 273.  
 Ceylon, handbook to the Flora of, 208.  
 Chenopodium album in Australia, 218.  
 Chestnut, Spanish, cultivation in Punjab, 113.  
 Chinese bandoline wood, 336.  
 Chitonina rubriceps, plate facing 115, 127.  
 Chlorophytum floribundum, *Baker*, 285.  
 Cirrhopetalum Curtisii, 333.  
 — robustum, 403.  
 Clavaria kewensis, plate facing p. 115, 135.  
 Cleome epilobioides, *Baker*, 243.  
 Coffee borers, 177, 182.  
 — cultivation at Gold Coast, 325.  
 — — in Lagos, 414.  
 —, Liberian, from Sierra Leone, 314.  
 Copra in Solomon Islands, 416.  
 Colonial development, aids to, 208.  
 Coriaria japonica, 84.  
 Cotton, cultivation in Egypt, 102.  
 Crassula nyikensis, *Baker*, 265.  
 — zombensis, *Baker*, 266.



*Crinum* (*Codonocrinum*) *parvum*, *Baker*, 284.  
*Crotalaria argyrolobioides*, *Baker*, 249.  
 — *cæspitosa*, *Baker*, 252.  
 — *gymnocalyx*, *Baker*, 252.  
 — *Johnstoni*, *Baker*, 250.  
 — *karongensis*, *Baker*, 252.  
 — *leucotricha*, *Baker*, 251.  
 — *nyikensis*, *Baker*, 250.  
 — *oocarpa*, *Baker*, 252.  
 — *pauciflora*, *Baker*, 251.  
 — *phyllostachys*, *Baker*, 250.  
 — *pilosiflora*, *Baker*, 251.  
 — *sparsifolia*, *Baker*, 249.  
 — *valida*, *Baker*, 253.  
*Croton Eleuteria*, 109.  
*Cyathula Mannii*, *Baker*, 278.  
 — *polycephala*, *Baker*, 278.  
*Cynanchum cucullatum*, *N. E. Brown*, 272.  
 — *lineare*, *N. E. Brown*, 273.  
 — *longipes*, *N. E. Brown*, 273.  
*Cynodon dactylon*, 209.  
*Cynoglossum nervosum*, 109.  
*Cynorchis grandiflora*, 424.  
 — *purpurascens*, 301.  
*Cypripedium Exul*, 84.  
*Cyprus*, *Shinia* in, 421.

## D.

Deasy, Capt., Tibetan dried plants, 208.  
*Deinbolia nyikensis*, *Baker*, 249.  
*Dendrobium denudans*, 301.  
 — *sarmentosum*, 169.  
 Department of Economic Botany in West Indies, 350.  
*Diagnoses Africanæ*, 243.  
*Dicoma megacephala*, *Baker*, 271.  
 — *nyikensis*, *Baker*, 271.  
*Didymocarpus malayana*, 169.  
*Dimorphotheca Ecklonis*, 207.  
 Disease, *Canna*, 173.  
 — *Lily bulb*, (with plate), 87.  
 —, *Slime-flux*, 423.  
 —, *Snowdrop*, 172.  
*Dissotis Whytei*, *Baker*, 267.

*Dolichos malosanus*, *Baker*, 262.  
 — *shuterioides*, *Baker*, 262.  
 — *trinervatus*, *Baker*, 262.  
*Dombeya tanganyikensis*, *Baker*, 244.  
 Dominica, report of Royal Commission, 380.  
 Double rice, 173.  
 Drift seeds from the Keeling Islands, 171.  
*Drimia Coleæ*, 424.  
 Durian in the West Indies, 406.  
*Durio zibethinus*, 406.

## E.

Egypt, Assam rubber in, 429.  
 —, cotton cultivation in, 102.  
*Ehrharta delicatula*, *Stapf*, 288.  
 — *Rehmannii*, *Stapf*, 288.  
 Engler, Prof., Tropical African dried plants, 241.  
*Eriosema cryptanthum*, *Baker*, 264.  
 Eucalyptus timber for street paving, 219.  
*Eugenia* (*Syzygium*) *masukensis*, *Baker*, 267.  
*Eunidia* sp., 179.  
*Euonymus europæus*, 167.

## F.

"Fat hen" in Australia, 218.  
 Fern house, tropical, at Kew, 404.  
*Ficus erecta*, var. *Sieboldii*, 301.  
 Fiji ivory nuts, 236.  
*Flammula purpurata*, plate facing 115, 127.  
*Flora Capensis*, 226.  
 — *Mycologic*, of Royal Gardens, Kew, (with plates), 115.  
 — of British Central Africa, 170.  
 — — — India, completion of, 205, 425.  
 — — Ceylon, handbook to, 208.

Floras, Insular, 112.  
 Flore de Juan Fernandez, 112.  
 — — l'Ile de la Reunion, 112.  
 Fodder plants in British Guiana,  
 209.  
 Forest products of Sierra Leone,  
 318.  
 France, wine production in, 201.  
 Fruit, Canadian, importation of,  
 425.  
 —, Grenada, in New York, 427.  
 — growing at the Cape, 191.  
 — industries in Jamaica, 242.  
 — trade in West Indies, 352.

## G.

Gasteria fusco-punctata, 301.  
 Geissapsis drepanocephala, *Baker*, 260.  
 Gentiana tibetica, 206.  
 Gentil, L., 333.  
 Geranium vagans, *Baker*, 246.  
 Gilg, Dr. E., Tropical African  
 dried plants, 241.  
 Gladiolus (*Eugladiolus*) John-  
 stoni, *Baker*, 283.  
 — masukuensis, *Baker*, 283.  
 — nyikensis, *Baker*, 283.  
 — (*Hebea*) stenophyllus, *Baker*,  
 282.  
 — venulosus, *Baker*, 282.  
 — (*Eugladiolus*) Whytei, *Baker*,  
 282.  
 Gold Coast, coffee cultivation at,  
 325.  
 Gomphocarpus setosus, 207.  
 Gongora tricolor, 206.  
 Gossypium barbadense, 102.  
 Grama grass, 224.  
 Grammatophyllum rumphia-  
 num, 84.  
 Grenada fruit in New York, 427.  
 —, report of Royal Commission,  
 373.  
 Grevillea hilliana, 169.  
 Gru gru palm kernels, 337.  
 Guinea grass in British Guiana,  
 210.  
 Gutta percha, extraction from  
 leaves, 200.

Gutta percha, stooling of, 337.  
 Gwynne Vaughan, D. T., 109.  
 Gymnosiphon squamatum, *C. H.*  
*Wright*, 281.  
 Gymnosporia ferruginea, *Baker*,  
 247.

## H.

Handlist of Tender Monoco-  
 tyledons, 229.  
 Helianthus giganteus, 333.  
 — tuberosus, 301.  
 Helichrysum concinnum, *N. E.*  
*Brown*, 269.  
 Hemipilia amethystina, 110.  
 Henry, Dr. A., botanical ex-  
 ploration in Yunnan, 99, 407.  
 Herbarium, additions to, 112,  
 171, 208, 241, 242.  
 —, United States National, 204.  
 Hermannia depressa, *N. E.*  
*Brown*, 245.  
 — erecta, *N. E. Brown*, 245.  
 — nyasica, *Baker*, 245.  
 Hermstædtia Welwitschii, *Ba-*  
*ker*, 278.  
 Hibiscus (*Bombycella*) Carsoni,  
*Baker*, 244.  
 Holland, J. H., 403.  
 Holothrix orthoceras, 169.  
 Hooker, Sir J. D., 205, 241.  
 Hooker's Icones Plantarum, 207.  
 Hop Hornbeam, 404.  
 Hydnohytium crassifolium, 86.  
 — Forbesii, 86.  
 — formicarium, 86.  
 — longiflorum, 86.  
 Hypoxis (*Euhypoxis*) malosana,  
*Baker*, 284.  
 — — nyasica, *Baker*, 284.  
 — — oligophylla, *Baker*, 284.

## I.

Impatiens zombensis, *Baker*,  
 247.  
 Index Kewensis, supplement to,  
 110.



- Indian Botanists, honours for, 241.  
*Indigofera fusco-setosa*, *Baker*, 256.  
 — (*Sphæridiophorum*) *karon-gensis*, *Baker*, 255.  
 — *lonchocarpifolia*, *Baker*, 256.  
 — *lupulina*, *Baker*, 254.  
 — *macra*, *Baker*, 255.  
 — *masukuensis*, *Baker*, 256.  
 — (*Sphæridiophorum*) *micro-calyx*, *Baker*, 256.  
 — *microscypha*, *Baker*, 255.  
 — *nyikensis*, *Baker*, 254.  
 — *patula*, *Baker*, 255.  
*Inesida leprosa*, 179.  
 Insects destructive to cultivated plants in West Africa, 175.  
 Insular Floras, 112.  
*Ipomœa operosa*, *C. H. Wright*, 275.  
 — *simulans*, 302.  
*Iris albopurpurea*, 84.  
 Ivory nuts, Fiji, 236.  
 —, Solomon Islands, 417.

## J.

- Jalap*, Tampico, 302.  
 Jamaica fruit industries, 242.  
 —, report of Royal Commission, 388.  
*Jarrah* for street paving, 219.  
 Johnston, Sir H. H., Tropical African dried plants, 241, 243.  
 Journal of Sir Joseph Banks, 85.

## K.

- Kalanchoe flammea*, *Stapp*, 266.  
 Karri for street paving, 219.  
 Keeling Islands, drift seeds from, 171.  
 Kei-apple as a hedge plant, 114.  
 Kew as an aid to colonial development, 209.  
 —, Handlist of Tender Monocotyledons, 229.

- Kew Herbarium, algæ in, 171.  
 —, Hop Hornbeam, 404.  
 —, list of *Nepenthes* cultivated at, 405.  
 —, Mycologic Flora of Royal Gardens (with plates), 115.  
 —, *Nepenthes* house, 404.  
 —, new edition of Key Plan, 301.  
 —, — wing of Temperate House, 333.  
 —, number of visitors in 1896, 84.  
 —, Pelican, 425.  
 — publications, 1841–1895, list of, 1, 238.  
 —, seed distribution, 169.  
 —, tropical Fern House, 404.  
 —, visit of King of Siam, 301.  
 —, water lily pond, 302.  
 —, — supply, 334.  
 Key Plan, new edition of, 301.  
 King of Siam, visit to Kew, 301.  
 Kino from *Myristica malabarica*, 101.  
 ‘Ko Wini’ sugar cane, 221.

## L.

- Lælia longipes*, 241.  
 Lagos, rubber and coffee in, 414.  
*Lagria villosa*, 186.  
 Lang, W. H., 109.  
*Laportea canadensis*, 430.  
 L’Archipel de la Nouvelle-Calédonie, 112.  
*Lasiodiscus marmoratus*, *C. H. Wright*, 248.  
*Lathyrus intricatus*, *Baker*, 261.  
 — *malosanus*, *Baker*, 261.  
 Liberian coffee at Gold Coast, 325.  
 — — from Sierra Leone, 314.  
 Library, additions to, 112.  
*Ligustrum coriaceum*, 110.  
*Lilium longiflorum*, var. *Harrisii* from Natal, 406.  
 Lily bulb disease (with plate), 87.

Lily culture in Natal, 406.  
 Lissochilus milanjanus, 301.  
 List of Kew publications, 1841-1895, 1, 238.  
 — — Nepenthes cultivated at Kew, 405.  
 Long Reign celebration, 240.  
 Lugard, Lieut. E. J., Tropical African dried plants, 242.  
 —, Major F. D., Tropical African dried plants, 242.  
 Lycoris squamigera, 301.

## M.

Macaw palm kernels, 337.  
 MacGregor, Sir W., New Guinea dried plants, 112.  
 Machilus Thunbergii, 336.  
 Madeira, osiers from, 338.  
 Mahon, J., 240.  
 Malcolm, Lieut., Tibetan dried plants, 208.  
 Malpighi Celebration, 403.  
 Mamea americana, 424.  
 Marram grass, 211.  
 Maxillaria houtteana, 207.  
 — sanderiana, 110.  
 Meade, Sir R., retirement of, 168.  
 Memecylon flavovirens, *Baker*, 268.  
 Mentzel, R., 423.  
 Mesquite grass, 226.  
 Metallonotus denticollis, 186.  
 Mexican whisk, 172.  
 Microcharis Galpini, *N. E. Brown*, 258.  
 Montserrat, report of Royal Commission, 382.  
 Mycologic Flora of Royal Gardens, Kew, (with plates), 115.  
 Myrmecodia Antoinii, 86, 110.  
 — Beccarii, 86.  
 — Rumphii, 86.  
 Myrmecophilous plants, Australian, 86.  
 Myrrh, 98.  
 Myristica malabarica, kino from, 101.

## N.

Natal, lily culture in, 406.  
 Nepenthes cultivated at Kew, list of, 405.  
 — house at Kew, 404.  
 New garden plants, Appendix II.  
 — Guinea dried plants, 112.  
 Niger Coast Protectorate Botanic Station, 113.

## O.

Obituary notices, 169, 206, 403.  
 Ochna longipes, *Baker*, 247.  
 — shirensis, *Baker*, 247.  
 Old Calabar, Botanic Station, 113.  
 Oncinotis Batesii, *Stapp*, 272.  
 Orange and Lemon borers, 177, 186.  
 Osiers from Madeira, 338.  
 Ostrya carpinifolia, 404.

## P.

Palm kernels, Argentine, 337.  
 Palms at Kew, 232.  
 Panicum maximum, 210.  
 — muticum, 209.  
 Papain, 104.  
 Para grass in British Guiana, 209.  
 Paracaryum heliocarpum, 110.  
 Parinarium (Sarcostegia) floribundum, *Baker*, 265.  
 Pelargonium Whytei, *Baker*, 246.  
 Pelican at Kew, 425.  
 Pennisetum (Beckeropsis) Kirkii, *Stapp*, 286.  
 Pentadesma butyracea, 320.  
 Peucedanum Buchanani, *Baker*, 268.  
 — heracleoides, *Baker*, 268.  
 — valerianæfolium, *Baker*, 269.



*Phaseolus semi-erectus* in Brit. Guiana, 210.  
*Phylloxera*, effects of, in France, 202.  
 Pike, A., Tibetan dried plants, 208.  
*Pilea floribunda*, *Baker*, 280.  
*Pistacia Lentiscus*, 421.  
*Pittosporum malosanum*, *Baker*, 244.  
 — *oblongifolium*, *C. H. Wright*, 243.  
*Plantago tanalensis*, *Baker*, 276.  
*Polygonum baldschuanicum*, 301.  
 — (*Persicaria*) *nyikense*, *Baker*, 280.  
*Polypodium* (*Phegopteris*) *efulense*, *Baker*, 299.  
 — (*Eupolypodium*) *forsythianum*, *Baker*, 300.  
 — (*Grammitis*) *microphyllum*, *Baker*, 299.  
 — (*Grammitis*) *tanalense*, *Baker*, 300.  
 Prices of home-grown timber for 1896, 97.  
*Primula farinosa* in the Andes, 208.  
 — *sinensis*, 403.  
*Prunus sub-hirtella*, 84.  
*Psilostachys Kirkii*, *Baker*, 279.  
*Psilotrichum concinnum*, *Baker*, 279.  
 — *debile*, *Baker*, 279.  
 — *rubellum*, *Baker*, 279.  
 — *trichophyllum*, *Baker*, 279.  
*Pterisanthes polita*, 403.

## R.

Raiz de Zacaton, 172.  
*Renanthera Storiei*, 241.  
*Rhaphidophora africana*, *N. E. Brown*, 286.  
 — *pusilla*, *N. E. Brown*, 286.  
*Rhizopus necans*, *Mass.* (with plate), 87.  
*Rhynchosia divaricata*, *Baker*, 264.

*Rhynchosia* (*Cyanospermum*) *floribunda*, *Baker*, 262.  
 — *imbricata*, *Baker*, 263.  
 — *nyasica*, *Baker*, 263.  
 — *nyikensis*, *Baker*, 263.  
 — *sphærocephala*, *Baker*, 264.  
*Rhytisma acerinum*, 140.  
 Rice, double, 173.  
 Ridley, H. N., drift seeds from the Keeling Islands, 171.  
 Rose of Jericho, 210.  
 Roth, Dr. J. R., 114.  
 Rubber industry in Lagos, 414.  
 —, Assam, in Egypt, 429.  
 — collecting in Sierra Leone, 319.  
 — in Solomon Islands, 419.  
*Rumex hymenosepalus*, 200.

## S.

Sago in Solomon Islands, 420.  
 St. Kitts-Nevis, report of Royal Commission, 386.  
 — Lucia, report of Royal Commission, 375.  
 — Vincent, report of Royal Commission, 377.  
*Salix alba*, 428.  
*Sansevieria* fibre from Sierra Leone, 315.  
*Scheelea kewensis*, 333.  
*Schistostephium artemisiæ-folium*, *Baker*, 270.  
 — *microcephalum*, *Baker*, 270.  
*Scitamineæ* at Kew, 230.  
*Sclerotinia Galanthi*, 172.  
*Scoliopus Bigelovii*, 424.  
 Scott, W., death of, 403.  
 Screw pines at Kew, 234.  
 Seed distribution at Kew, 169.  
 Seeds of herbaceous plants and of trees and shrubs available for exchange, Appendix I.  
*Selinus planus*, 186.  
*Senecio* (*Kleinia*) *antitensis*, *Baker*, 270.  
 — (*Kleinia*) *nyikensis*, *Baker*, 271.  
 — *Smithii*, 206.

Sericocoma Welwitschii, *Baker*, 278.  
 Seychelles, Vanilla cultivation, 113.  
 Shinia in Cyprus, 421.  
 Sierra Leone, Botanic Station (with plan), 303.  
 — — butter and tallow tree, 320.  
 — —, forest products of, 318.  
 — —, Liberian coffee from, 314.  
 — —, rubber collecting in, 319.  
 Siam, King of, visit to Kew, 301.  
 Slime-flux, 423.  
 Smithia (Kotschya) congesta, *Baker*, 259.  
 — (Kotschya) drepanophylla, *Baker*, 260.  
 — (Kotschya) sphærocephala, *Baker*, 260.  
 Snowdrop disease, 172.  
 Socotra dried plants, 242.  
 Solanum nakurense, *C. H. Wright*, 275.  
 Solomon Islands, 416.  
 Sorghum sugar, 173.  
 Spanish chestnut, cultivation in Punjab, 113.  
 Spindle tree, 167.  
 Staffs of Botanical Departments, list of, Appendix III.  
 Strachey, Lieut.-General, 241.  
 Strobilanthes callosus, 241.  
 Sugar-beet, improvement of, 317.  
 — cane, grafting, 221.  
 — —, improvement of, 317.  
 — industry, 346.  
 — Sorghum, 173.  
 — trade, West India, 92.  
 Swertia nummularifolia, *Baker*, 274.  
 Syringa amurensis, 207.  
 Syringodea luteo-nigra, *Baker*, 281.

## T.

Tachiadenus parviflorus, *Baker*, 274.  
 Tainia penangiana, 424.  
 Tampico Jalap, 302.

Tecoma Whytei, *C. H. Wright*, 275.  
 Temperate House, new wing of, 333.  
 Tender Monocotyledons, hand-list of, 229.  
 Tengah bark, 91.  
 Tephrosia (Reineria) dissitiflora, *Baker*, 257.  
 — — melanocalyx, *Baker*, 258.  
 — — nyikensis, *Baker*, 257.  
 — — periculosa, *Baker*, 258.  
 — — zombensis, *Baker*, 257.  
 Thorpe, W., 84.  
 Thurston, Sir J., death of, 169.  
 Tibetan dried plants, 208.  
 Timber, home-grown, prices for 1896, 97.  
 Tobago, report of Royal Commission, 371.  
 Trianthema nyasica, *Baker*, 268.  
 Trichocladus malosanus, *Baker*, 266.  
 Trichopteryx acuminata, *Stapf*, 297.  
 — annua, *Stapf*, 298.  
 — camerunensis, *Stapf*, 296.  
 — flavida, *Stapf*, 298.  
 — gigantea, *Stapf*, 295.  
 — hordeiformis, *Stapf*, 297.  
 — nigrifolia, *Stapf*, 297.  
 — ramosa, *Stapf*, 298.  
 Trinidad, report of Royal Commission, 366.  
 Tristachya biseriata, *Stapf*, 295.  
 — glabra, *Stapf*, 294.  
 — tuberculata, *Stapf*, 294.  
 Tristania laurina, 206.  
 Tropical African dried plants, 241.

## U.

United States National Herbarium, 204.  
 Uredo Cannæ, 173.



## V.

- Vanilla cultivation in the Seychelles, 113.  
 Veitch & Sons, New Guinea dried plants, 112.  
 Veitchia Joannis, 236.  
 Vernonia humilis, *C. H. Wright*, 269.  
 Veronica balfouriana, 333.  
 — diosmæfolia, var. trisepala, 241.  
 Victoria Herbarium, 427.  
 — regia, 333.  
 Vigna malosana, *Baker*, 261.  
 Visitors to Kew, number of, in 1896, 84.  
 Vitis (Cissus) apodophylla, *Baker*, 248.  
 — — masukuensis, *Baker*, 249.  
 — — variifolia, *Baker*, 248.

## W.

- Water Lily pond, 302.  
 — supply at Kew, 334.  
 Weihea malosana, *Baker*, 267.  
 Wellby, Capt., Tibetan dried plants, 208.

- West Africa, botanical enterprise in, 329.  
 — —, destructive insects, 175.  
 — India Royal Commission, 109, 339.  
 — — sugar trade, 92.  
 — Indies, Durian in, 406.  
 — —, proposed Department of Economic Botany, 350.  
 White Willow, 428.  
 Whitney sugar cane, 221.  
 Whyte, A., Tropical African dried plants, 241, 243.  
 Willow, White, 428.  
 Wine production in France, 201.  
 Wistaria chinensis, var. multi-juga, 169.

## Y.

- Yellow Bamboo sugar cane, 221.  
 Yuccas, Aloes and Agaves at Kew, 231.  
 Yunnan, a budget from, 407.  
 —, botanical exploration in, 99.

## Z.

- Zamia obliqua, 301.

